

Amendment/Response

Reply to Final Office Action of November 1, 2006

REMARKS/DISCUSSION OF ISSUES

Claims 1-13 are pending in this application, with claim 1 being amended. It is noted that the Examiner in the Advisory Action dated March 23, 2007 checked block 1(a) by mistake, and should have checked block 1(b), since the first reply to the Final Office Action dated November 1, 2006 was filed on December 4, 2006, well within the two month period. The fee for the extension of time is therefore the two-month fee instead of the three-month fee. See MPEP 706.07(f).

Rejections under 35 U.S.C. § 102(b)

Claims 1-7 and 10 are rejected under 35 U.S.C. § 102(b) as anticipated by Nishida (US Patent 5,584,941). The rejection of the claims is respectfully traversed.

For anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly (MPEP 706.02 IV).

Photocells are similar to solar cells. In both, incoming light generates voltages and with it currents. In the solar cell, this voltage is generated at the junction, which is formed at the interface of two parallel layers. In Ishida, one can see e.g. in Fig. 5C how the light beam hits the surface of the device perpendicular to the films, passes through a NSG cap film (Fig 5B, 404), than a Si-film 403, followed by the ZnO film 402. The ZnO film is deposited on a Cu film 409, and this is deposited on the SUS substrate 401.

The junction is formed at the Si-film. It generates an electric field perpendicular to the Si-film. The current should flow in the direction for the electric field. Therefore, the current through the thin films in the solar cell of the Nishida Patent flows essentially perpendicular through the interfaces between the thin films, and also perpendicular from the thin film adjacent to the bottom substrate to the 0.8 mm thick SUS substrate 401.

In contrast, the current flow in the ultra thin metal film of the device described in the present patent application flows only parallel to the surface, because the resistance in the substrate is orders of magnitude larger than the resistance in the metal film, because the substrate is made of semiconducting or insulating materials.

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Nishida always has a semiconducting layer with a metal oxide layer in his device. He needs it to have a pn or pin junction for the device to work. In Experiment 2 (column 4, line 38 and further down) the semiconductor-metal oxide film pair is made up of Si and ZnO. A depletion layer forms at the interface between Si and ZnO where an electrical voltage is generated. This voltage produces the current of the device. It has to flow perpendicular to the interface between Si and ZnO, and therefore also in all other films.

Nishida discloses a solar cell with elements similar to the claimed invention, but differs in one notable aspect: the current flow in the solar cell is substantially orthogonal to the plane formed by the juncture of the film and the substrate. In photocell inventions, the various layers form a "sandwich" in which the current flow is from the top sandwich film to the bottom sandwich film, or vice versa. In other words, the current flow is perpendicular to the film surfaces. In the claimed invention, this is not the case. In the claimed invention, the current flow is parallel to the film surfaces instead of perpendicular as in all the photovoltaic cell inventions. The present invention does not have conduction, or charge transfer, "through" the differing layers, but rather in the film "along" the layer.

This is why the previous amendment added the claim limitation of "wherein a juncture of said film and said substrate forms a plane; wherein a current flow within said film is substantially parallel to said plane" to claim 1. The present amendment also adds the limitation of no p-n or pin junction being in the apparatus.

In addition, a metallic film on a non-metallic substrate is not disclosed in Nishida nor any of the previous prior art references cited. Layer 202 in Nishida is not a metal, nor a metallic alloy, nor a multilayered film which includes at least one metallic layer. Layer 202 is simply a metal oxide layer. This point has not been addressed by the Examiner.

Thus, three claimed limitations are found in claim 1 of the present invention which are not disclosed in Nishida.

It is therefore respectfully suggested that the rejection of Claim 1 under 35 U.S.C. § 102 (b) as being anticipated by Nishida is unfounded in light of the previous and current amendments. Claims 2-7 and 10, being dependent upon and further limiting independent claim 1 should be allowable for that reason as well as for the additional limitations they contain.

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Reconsideration of the rejection of claims 1-7 and 10 under 35 U.S.C. § 102 (b) is therefore respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Claims 8-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishida. Reconsideration of the rejection of claims 8-9 is respectfully requested.

Claims 8-9 (and claims 11-13) being dependent upon and further limiting independent claim 1 should be allowable for that reason as well as for the additional limitations they contain. Reconsideration of the rejection of claims 8-9 (and claims 11-13) under 35 U.S.C. § 103(a) is therefore respectfully requested.

In view of the foregoing, Applicants respectfully request that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application in condition for allowance. If any points remain in issue that may be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated or by e-mail directed to Chris@PatentingServices.com.

Respectfully submitted,



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